AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1-32. (canceled)

33. (currently amended) A method, wherein a target nucleic acid sequence is detected, comprising the following steps:

a) ~~immobilizing~~ providing an oligonucleotide probe immobilized to a solid support ~~via a solid phase anchor~~, said immobilized probe comprising ~~at least one 3'-end sequence, an intermediate sequence comprising a solid phase anchor, and at least one 5'-end sequence, wherein the 3'-end sequence or 5'-end sequence further comprises at least one detectable function and a cleavable site between the detectable function and the solid phase anchor~~ two end parts having at least one 3'-end sequence and at least one 5'-end sequence, wherein one of said end parts is provided with a solid phase anchor by which the probe is immobilized to the support and wherein said other end part comprises:

i) at least one detectable function and a cleavable site which lies between the detectable function and the solid phase anchor, or

ii) at least one detectable function provided on a dissociable part of said probe,

b) contacting the immobilized probe with a target nucleic acid sequence allowing the 3'-end and the 5'end of said immobilized probe to hybridize to at least substantially neighbouring regions of said target nucleic acid sequence under hybridizing conditions;

c) covalently ~~linking~~ connecting the ends of the hybridized oligonucleotide probe to each other to form a circularized structure;

d) cleaving the circularized and non-circularized oligonucleotide probe at the cleavable site between the detectable function and the solid phase anchor or dissociating said dissociable probe part;

so that if said probe is circularized in step c), the probe part comprising the detectable function becomes covalently connected to the support, and cannot be detached from said immobilized probe by said cleavage or dissociation;

but wherein if said probe is not circularized in step c), the probe part comprising the detectable function is not covalently connected to the other probe part comprising the solid phase anchor, and hence is not covalently connected to the support, and can be detached from said immobilized probe by said cleavage or dissociation;

e) separating non-connected detectable functions from the solid support by washing under denaturing conditions;

f) detecting the presence, and optionally, quantity and/or location of the remaining detectable function.

34. (previously presented) The method according to claim 33, wherein one or both of the probe ends have at least two branches, and a detectable function is provided on each of the branches on one end part of said probe, the detectable functions being different and distinguishable from each other.

35. (previously presented) The method according to claim 34, wherein one probe end is linear and the other probe end is branched.

36-37. (canceled)

38. (previously presented) The method according to claim 33, wherein said target-specific probe is designed to hybridize to the target nucleic acid sequence to leave an interspace between the probe ends, at least one additional probe is provided which is designed to hybridize to the target nucleic acid sequence in said interspace, and the hybridized probes are covalently interconnected.

39. (previously presented) The method according to claim 33, wherein said target-specific probe or probes are designed to hybridize to the target nucleic acid sequence to leave a small gap between adjacent probe ends, and said gap or

gaps are filled by an extension reaction prior to covalently interconnecting the probe ends.

40. (previously presented) The method according to claim 33, wherein said covalent connection of the probe ends is performed by enzymatic, ribozyme-mediated or chemical ligation.

41. (previously presented) The method according to claim 33, wherein said target nucleic acid is a DNA or RNA sequence.

42. (previously presented) The method according to claim 33, wherein said oligonucleotide probe or probes are immobilized via biotin to a streptavidin-coated solid phase.

43. (new) A method, wherein a target nucleic acid sequence is detected, comprising the following steps:

a) providing an oligonucleotide probe immobilized to a solid support, said immobilized probe comprising two end parts having at least one 3'-end sequence and at least one 5'-end sequence, wherein one of said end parts is provided with a solid phase anchor by which the probe is immobilized to the support and wherein said other end part comprises (i) at least one detectable function and a cleavable site which lies between the detectable function and the solid phase anchor, or (ii) at least one detectable function provided on a dissociable part of said probe,

b) contacting the immobilized probe with a target nucleic acid sequence allowing the 3'-end and the 5'end of said immobilized probe to hybridize to at least substantially

neighboring regions of said target nucleic acid sequence under hybridizing conditions;

c) covalently connecting the ends of the hybridized oligonucleotide probe to each other to form a circularized structure;

d) cleaving the circularized and non-circularized oligonucleotide probe at the cleavable site between the detectable function and the solid phase anchor or dissociating said dissociable probe part;

so that if said probe is circularized in step c), the probe part comprising the detectable function becomes covalently connected to the other probe part comprising the solid phase anchor and thereby connected to the support, and cannot be detached (or de-connected) from said immobilized probe by said cleavage or dissociation;

but wherein if said probe is not circularized in step c), the probe part comprising the detectable function is not covalently connected to the other probe part comprising the solid phase anchor, and hence is not covalently connected to the support, and can be detached (or de-connected) from said immobilized probe by said cleavage or dissociation;

e) separating non-connected detectable functions from the solid support by washing under denaturing conditions;

f) detecting the presence, and optionally, quantity and/or location of the remaining detectable function, and

wherein said probe comprises two padlock probes and said dissociable part is a second circular (padlock) probe hybridizing to said target-specific probe.

44. (new) A method, wherein a target nucleic acid sequence is detected, comprising the following steps:

a) providing an oligonucleotide probe immobilized to a solid support, said immobilized probe comprising two end parts having at least one 3'-end sequence and at least one 5'-end sequence, wherein one of said end parts is provided with a solid phase anchor by which the probe is immobilized to the support and wherein said other end part comprises (i) at least one detectable function and a cleavable site which lies between the detectable function and the solid phase anchor, or (ii) at least one detectable function provided on a dissociable part of said probe,

b) contacting the immobilized probe with a target nucleic acid sequence allowing the 3'-end and the 5'end of said immobilized probe to hybridize to at least substantially neighboring regions of said target nucleic acid sequence under hybridizing conditions;

c) covalently connecting the ends of the hybridized oligonucleotide probe to each other to form a circularized structure;

d) cleaving the circularized and non-circularized oligonucleotide probe at the cleavable site between the

detectable function and the solid phase anchor or dissociating said dissociable probe part;

so that if said probe is circularized in step c), the probe part comprising the detectable function becomes covalently connected to the other probe part comprising the solid phase anchor and thereby connected to the support, and cannot be detached (or de-connected) from said immobilized probe by said cleavage or dissociation;

but wherein if said probe is not circularized in step c), the probe part comprising the detectable function is not covalently connected to the other probe part comprising the solid phase anchor, and hence is not covalently connected to the support, and can be detached (or de-connected) from said immobilized probe by said cleavage or dissociation;

e) separating non-connected detectable functions from the solid support by washing under denaturing conditions;

f) detecting the presence, and optionally, quantity and/or location of the remaining detectable function, and

wherein said probe comprises two padlock probes and said dissociable part is said target-specific probe hybridizing to a second circular (padlock) probe carrying said solid phase anchor.

45. (new) The method according to claim 33, wherein said cleavage site is a disulphide or a deoxyuridine residue or a peptide residue or a nucleotide sequence susceptible to cleavage

by endonuclease, wherein in step d), cleavage of the oligonucleotide probe takes place using a cleaving agent being a reducing agent, a uracil DNA glycosylase, a peptidase or an endonuclease, respectively.

46. (new) A method, wherein a target nucleic acid sequence is detected, comprising the following steps:

a) providing an oligonucleotide probe, said probe comprising two end parts comprising at least one 3'-end sequence and at least one 5'-end sequence, a solid phase anchor and wherein one end part comprises (i) at least one detectable function and a cleavable site which lies between the detectable function and the solid phase anchor, or (ii) at least one detectable function provided on a dissociable part of said probe,

b) contacting the probe with a target nucleic acid sequence allowing the 3'-end and the 5'end of said immobilized probe to hybridize to at least substantially neighboring regions of said target nucleic acid sequence under hybridizing conditions;

c) covalently connecting the ends of any hybridized oligonucleotide probe to each other to form a circularized structure;

d) cleaving the circularized and non-circularized oligonucleotide probe at the cleavable site between the detectable function and the solid phase anchor or dissociating said dissociable probe part;

so that if said circularized probe in step c), the probe part comprising the detectable function becomes covalently connected to the other probe part comprising the solid phase anchor and thereby connected to the support, and cannot be detached (or de-connected) from said immobilized probe by said cleavage or dissociation;

but wherein if said probe is not circularized in step c), the probe part comprising the detectable function is not covalently connected to the other probe part comprising the solid phase anchor, and hence is not covalently connected to the support, and can be detached (or de-connected) from said immobilized probe by said cleavage or dissociation;

e) separating non-connected detectable functions from the solid support by washing under denaturing conditions;

f) detecting the presence, and optionally, quantity and/or location of the remaining detectable function, and

wherein said cleavage site is a disulphide or a deoxyuridine residue or a peptide residue or a nucleotide sequence susceptible to cleavage by endonuclease, wherein in step d), cleavage of the oligonucleotide probe takes place using a cleaving agent being a reducing agent, a uracil DNA glycosylase, a peptidase or an endonuclease, respectively.